ELECTRONICS

7044
TWIN TRIODE
FOR COMPUTER APPLICATIONS

DESCRIPTION AND RATING

MEDIUM MU
9-PIN MINIATURE

HIGH PERVEANCE
HEATER-CYCLING RATING

The 7044 is a miniature, medium-mu, twin triode designed especially for service in computer applications. The tube features high zero-bias plate current and exceptional freedom from cathode interface development. Incorporated in the 7044 is a heater-cathode construction capable of withstanding many-thousand cycles of intermittent operation.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

	Series	Parallel	
Heater Voltage, AC or DC	12.6 ± 10%	6.3 ± 10%	Volts
Heater Current	0.45	0.9	Amperes

Direct Interelectrode Capacitance*

	Section 1	Section 2	
Grid to Plate: (g to p)	6.0	6.0	μμf
Input: g to (h+k)	4.8	4.8	μμf
Output: p to (h+k)	0.65	0.55	μμf
Heater to Cathode: (h to k)	6.0	6.0	μμf
Grid to Grid: (1g to 2g)	0.1		μμf
Plate to Plate: (1p to 2p)	1.4		μμf

MECHANICAL

Mounting Position—
- Preferred Orientation—Upright or with Plate Majors in Vertical Position
- Permissible Orientation—Any

Envelope—T-6½, Glass
Base—E9-1, Small Button 9-Pin
Outline Drawing—EIA 6-3

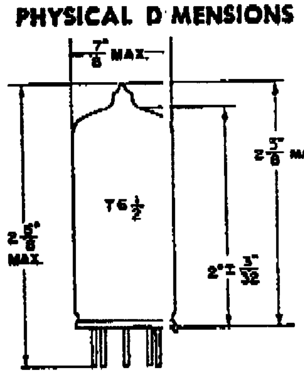
Maximum Diameter	⅞	Inches
Maximum Over-all Length	2⅝	Inches
Maximum Seated Height	2⅜	Inches

MAXIMUM RATINGS

ABSOLUTE MAXIMUM VALUES, EACH SECTION†

Plate Voltage, Average‡	300	Volts
Peak Plate Voltage‡¶	600	Volts
Positive DC Grid Voltage	1.0	Volts
Negative DC Grid Voltage	100	Volts
Peak Positive Grid Voltage¶	30	Volts
Peak Negative Grid Voltage¶	300	Volts
Plate Dissipation, Each Plate, Average‡	4.5	Watts
Total Plate Dissipation, Both Plates, Average‡	8.0	Watts
DC Grid Current, Average‡	5.0	Milliamperes
Peak Grid Current¶	200	Milliamperes
DC Cathode Current, Average‡	50	Milliamperes
Peak Cathode Current¶	400	Milliamperes
Heater-Cathode Voltage		
Heater Positive with Respect to Cathode #		
DC Component	100	Volts
Total DC and Peak	200	Volts
Heater Negative with Respect to Cathode		
Total DC and Peak	200	Volts
Grid Circuit Resistance		
With Fixed Bias	0.1	Megohms
With Cathode Bias	0.47	Megohms
Bulb Temperature at Hottest Point	160	C

PHYSICAL DIMENSIONS

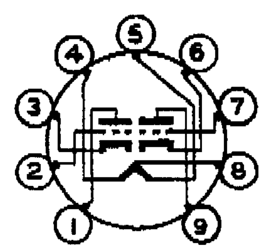


EIA 6-3

TERMINAL CONNECTIONS

Pin 1—Plate (Section 2)
Pin 2—Grid (Section 2)
Pin 3—Cathode (Section 2)
Pin 4—Heater
Pin 5—Heater
Pin 6—Cathode (Section 1)
Pin 7—Grid (Section 1)
Pin 8—Heater Center-Tap
Pin 9—Plate (Section 1)

BASING DIAGRAM



EIA 9H

CHARACTERISTICS AND TYPICAL OPERATION

Average Characteristics, Each Section				
Plate Voltage	90	150	120	Volts
Grid Voltage	++		−2.0	Volts
Amplification Factor			21	
Plate Resistance, approximate			1750	Ohms
Transconductance			12000	Micromhos
Plate Current	47		36	Milliamperes
Grid Voltage, approximate Ib = 200 Microamperes		−11		Volts

INITIAL CHARACTERISTICS LIMITS

	Minimum	Maximum	
Heater Current Ef = 12.6 volts	410	490	Milliamperes
Zero-Bias Plate Current, Each Section Ef = 12.6 volts, Eb = 90 volts, Ic = 250 μa	41	62	Milliamperes
Plate Current, Each Section Ef = 12.6 volts, Eb = 120 volts, Ec = −2 volts	26	45	Milliamperes
Plate Current Cutoff, Each Section Ef = 12.6 volts, Eb = 150 volts, Ec = −14 volts		200	Microamperes
Negative Grid Current, Each Section Ef = 12.6 volts, Eb = 120 volts, Ec = −2 volts		1.5	Microamperes
Heater-Cathode Leakage Current Ef = 12.6 volts, Ehk = 100 volts (parallel sections)			
Heater Positive with Respect to Cathode		30	Microamperes
Heater Negative with Respect to Cathode		30	Microamperes
Interelectrode Leakage Resistance Ef = 12.6 volts. Polarity of applied d-c interelectrode voltage is such that no cathode emission results			
Grid (Each Section) to All at 300 volts d-c	50		Megohms
Plate (Each Section) to All at 500 volts d-c	50		Megohms

Absolute-Maximum ratings are limiting values of operating and environmental conditions applicable to any electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making no allowance for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.

The equipment manufacturer should design so that initially and throughout life no absolute-maximum value for the intended service is exceeded with any tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.

SPECIAL TESTS AND RATINGS

Heater-Cycling		
2000-Cycle Life-Test Endpoint, Maximum		
Heater-Cathode Leakage‡‡	90	Microamperes
Cathode-Interface Impedance		
1000-Hour Life-Test Endpoint, Maximum¶¶	25	Ohms
Intermittent Shorts§§		

* Without external shield.

† Pulse terms in accordance with "Standards on Pulses: Definitions of Terms—Parts I and II—1951, 1952"; IRE.

‡ Averaging time 1 millisecond unless otherwise specified.

§ Measured between plate and a cathode.

¶ Rating based on a rectangular pulse of 10 μsec width, 1% duty factor (=0.1%), and 1 KC repetition rate. The rise time shall be less than 1 μsec and the fall time shall be less than 2 μsec. Overshoot shall be less than 5% and droop shall be less than 10%.

Not recommended for reliable operation.

**With grid current adjusted for approximately 250 microamperes.

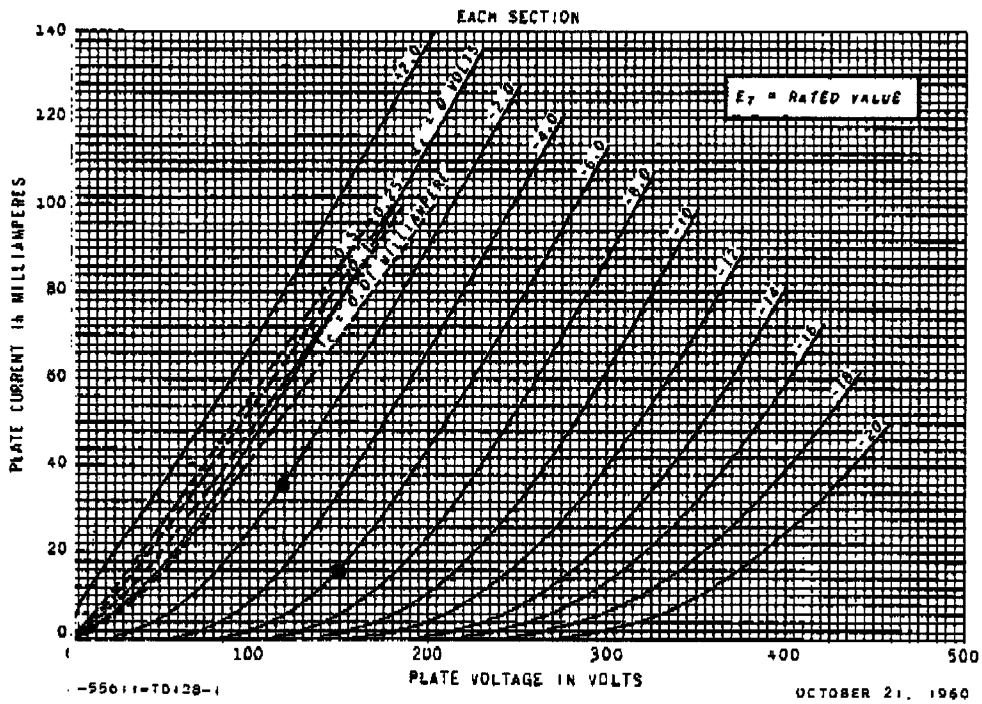
‡‡Statistical sample operated for 2000 cycles. Conditions of test include Ef = 7.5 volts (parallel heater connection), cycled for one minute on and one minute off, Eb = Ec = 0 volts, and Ehk = 135 volts with heater positive with respect to cathode.

¶¶ Statistical sample operated for 1000 hours under the following conditions for each section: Ef = 6.3 volts, Eb = 150 volts, Ecc = −100 volts, Ehk = −100 volts, and Rg = 0.1 megohms.

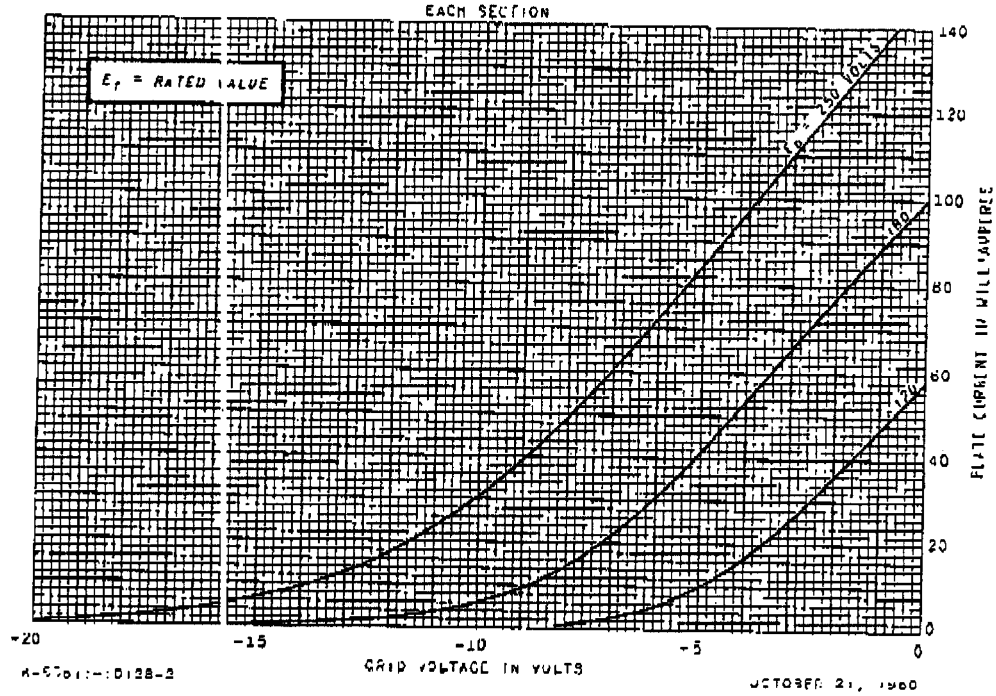
§§Intermittent shorts are measured with equipment capable of detecting resistances as follows:
less than 100,000 ohms for 15 microseconds
less than 2.5 megohms for 1 millisecond

The acceleration applied to the tube is an approximate half-sinusoid of 50 to 100 G for a base duration of approximately 500 microseconds.

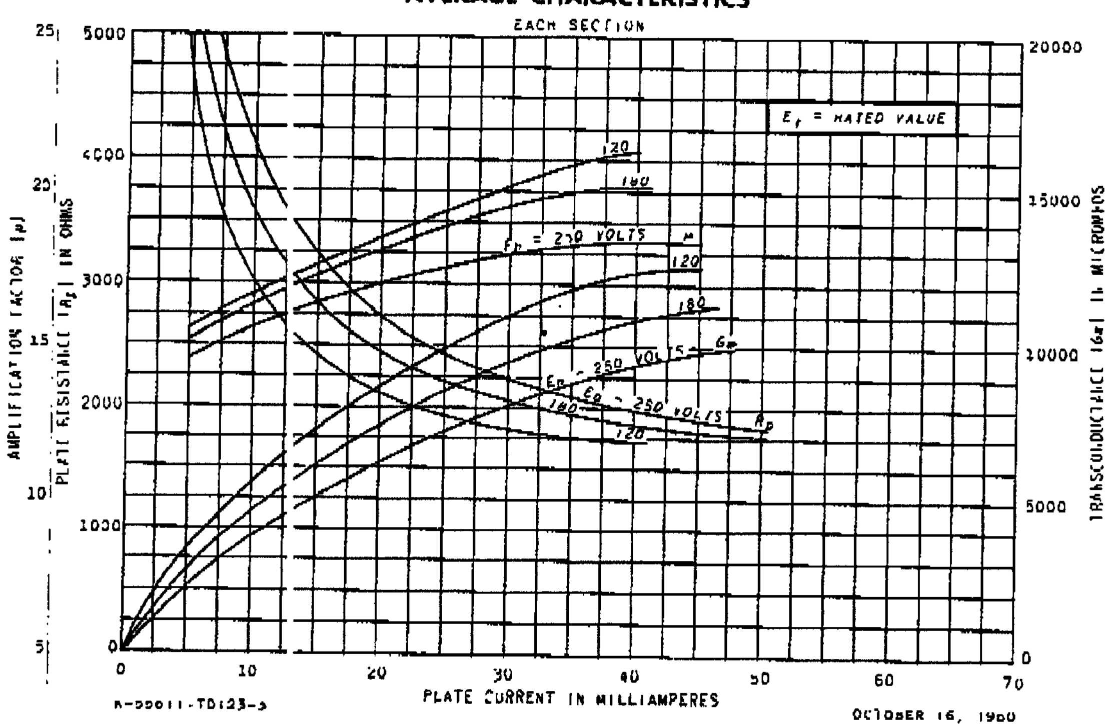
AVERAGE PLATE CHARACTERISTICS



AVERAGE TRANSFER CHARACTERISTICS



AVERAGE CHARACTERISTICS



RECEIVING TUBE DEPARTMENT

GENERAL ELECTRIC

Owensboro, Kentucky